| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/510,395 | 10/04/2004 | Wayne Robert Tompkin | 1093-109 PCT/US | 6290 |

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| EXAMINER |
|---|
| KHOSHNOODI, NADIA |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/510,395 | TOMPKIN ET AL. |
| | Examiner | Art Unit | |
| | NADIA KHOSHNOODI | 2137 | |

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on <u>7/31/2008</u>.

2a) ☐ This action is **FINAL**.  2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) <u>1-19</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-19</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>04 October 2004</u> is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All  b) ☐ Some * c) ☐ None of:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
         application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>4/7-31-2008</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____

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U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)  **Office Action Summary**  Part of Paper No./Mail Date 20080927

## DETAILED ACTION

### *Information Disclosure Statement*

The information disclosure statement filed 7/31/2008 fails to comply with the provisions

of 37 CFR 1.97, 1.98 and MPEP § 609 because although references JP6295420 and JP271178

have included the concise explanation as to the relevance to of these references, the explanation

has been cut off.  Various other references have not been considered because no English abstract

was included.  Finally, it seems that NPL document "Notification of Reasons for Rejection" filed

under 'Prior Art' was not included in the IDS and thus has not been considered. It has been

placed in the application file, but the information referred to therein has not been considered as

to the merits.  Applicant is advised that the date of any re-submission of any item of information

contained in this information disclosure statement or the submission of any missing element(s)

will be the date of submission for purposes of determining compliance with the requirements

based on the time of filing the statement, including all certification requirements for statements

under 37 CFR 1.97(e).  See MPEP § 609.05(a).

### *Drawings*

The drawings are objected to because descriptive labels other than numerical are needed

at least for figures 1-2, 6, and 8a-8b (since these figures depict the actual physical for of the

security element).  See 37 CFR 1.84(o).  A proposed drawing correction or corrected drawings

are required in reply to the Office action to avoid abandonment of the application.  The objection

to the drawings will not be held in abeyance.

### *Claim Objections*

Claim 1 is objected to because of the following informalities:

It seems as though this claim lacks a proper transitional phrase separating the preamble and the body of the claim. The word "comprising" appears after the phrase "a security element" however since there is no colon, it is unclear as to whether or not Applicants intended this to be the transitional phrase.

Examiner also notes that the claimed elements seem to lack structure based on the arrangement of the claimed limitations. Examiner suggests that Applicants address the claimed limitations in some type of format (breaking each limitation up by a semicolon if possible) in order to present the claims in a format which better indicates the various features of the claimed invention.

Finally, Applicants in line 9 of the claim state "additive or substructive" where Examiner believes Applicants may have intended for "substructive" to be "subtractive."

Appropriate corrections are required.

Claims 7, 9, 11-13, 17 and 19 are objected to because of the following informalities:

Similarly to claim 1, the claimed elements in these claims also seem to lack structure based on the arrangement of the claimed limitations. Examiner suggests that Applicants address the claimed limitations in some type of format (breaking each limitation up by a semicolon if possible) in order to present the claims in a format which better indicates the various features of the claimed invention.

## *Claim Rejections - 35 USC § 112*

I.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

II.     Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

As per claim 1:

        The term "optically effective structure" in lines 13-14 in this claim is a relative term

which renders the claim indefinite.  The term "optically effective structure" is not defined by the

claim, the specification does not provide a standard for ascertaining the requisite degree, and one

of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

        In the phrase "portion-wise steady" in reference to the superimposition function in lines

15-16 of this claim, the term 'steady' is a relative term which renders the claim indefinite.  Thus

the phrase "portion-wise steady superimposition" is not defined by the claim, the specification

does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the

art would not be reasonably apprised of the scope of the invention.

        The term "local angle of inclination" in reference to the superimposition function in lines

17 of this claim is a relative term which renders the claim indefinite.  The phrase "local angle of

inclination" is not defined by the claim, the specification does not provide a standard for

ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably

apprised of the scope of the invention.

The term "slowly" in line 18 of this claim is a relative term which renders the claim indefinite. The phrase "slowly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Overall, independent claim 1 and dependent claims 7, 9, 11-13, 17 and 19 are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Furthermore, Applicants are encouraged to review the claims and clarify the scope of each element so that the scope of the claim as a whole may be readily ascertained. The Examiner has identified several phrases which render the claim unclear/indefinite, however this list may not be exhaustive since once those phrases are clarified there may be new portions of the claim which may require clarification. For the purposes of examination, Examiner has attempted to interpret the scope of the claims to the best of her ability.

**Claims not specifically addressed are rejected by virtue of their dependency.

### *Allowable Subject Matter*

III.    Claim 11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

### *Claim Rejections - 35 USC § 103*

IV.     The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains.  Patentability shall not be negatived by the
> manner in which the invention was made.

V.      Claims 1-10 and 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Staub et al., US Patent No. 6,324,004 and further in view of Antes et al., US Patent No.

4,984,824.

As per claim 1:

        Staub et al. substantially teach a security element comprising: a layer composite with

microscopically fine optically effective structures of a surface pattern, which are embedded

between transparent layers of the layer composite (col. 2, lines 20-52), wherein the optically

effective structures are shaped into a reflecting interface between the layers in surface portions of

a security feature in a plane of the surface pattern, which is defined by co-ordinate axes (x; y)

(col. 6, lines 15-47), wherein at least one surface portion comprises a diffraction structure formed

by additive or subtractive superimposition of a superimposition function (M) describing a

macroscopic structure, with a microscopically fine relief profile (R) (col. 2, lines 25-29 and fig.

1), wherein the superimposition function (M), the relief profile (R) and the diffraction structure

are functions of the co-ordinates (x; y) (col. 6, lines 15-47) and the relief profile (R) describes a

light-diffracting or light-scattering, optically effective structure which, following the

superimposition function (M), retains the predetermined relief profile (R) (col. 2, lines 40-52),

and wherein a central surface defined by the at least portion-wise steady superimposition

function (M) is curved at least in partial regions and at any point has a local angle of inclination predetermined by the gradient of the superimposition function (M), is not a periodic triangular or rectangular function and changes slowly in comparison with the relief profile (R) (col. 2, line 53 – col. 3, line 35).

Not explicitly disclosed is wherein the surface portion is of dimensions greater than 0.4 mm. However, Antes et al. teach that multiples of .1mm may be used for a surface portion (col. 4, lines 1-10), as well as that there may be a plurality of surface portions, some of which may be greater than .3mm (col. 2, lines 23-34). Therefore, it would have been obvious to a person in the art at the time the invention was made to modify the method disclosed in Staub et al. to have the surface portion be a size of greater than .4mm. This modification would have been obvious because a person having ordinary skill in the art, at the time the invention was made, would have been motivated to do so since Antes et al. suggest that when the size of the surface portion is greater than .3mm it allows the identification marks to be visible to the human eye in col. 4, lines 11-24.

As per claim 2:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 1. Furthermore, Staub et al. teach wherein the superimposition function (M) is a portion-wise steady, periodic function with a spatial frequency of at most 20 lines/mm (col. 6, lines 48-54).

As per claim 3:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 1. Furthermore, Staub et al. teach wherein the superimposition function (M) is an asymmetrical,

portion-wise steady, periodic function with a spatial frequency in the range of between 2.5

lines/mm and 10 lines/mm (col. 2, lines 58-67).

As per claim 4:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

1. Furthermore, Staub et al. teach wherein adjacent extreme values of the superimposition

function (M) in the surface portion are remote from each other by at least 0.025 mm (col. 4, lines

24-43).

As per claim 5:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

2. Furthermore, Staub et al. teach wherein relief profile (R) is a diffraction grating of constant

profile height, which has a grating vector with an azimuth angle and with a spatial frequency of

greater than 300 lines/mm (col. 6, lines 8-14).

As per claim 6:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

2. Furthermore, Staub et al. teach wherein the relief profile (R) is an anisotropic matt structure

which has a preferred direction with an azimuth angle (col. 3, lines 25-35).

As per claim 7:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

5. Furthermore, Staub et al. teach wherein the security feature has at least two adjacent surface

portions and wherein the first diffraction structure is shaped in the first surface portion and the

second diffraction structure which differs from the first diffraction structure is shaped in the

second surface portion, wherein the grating vector or the preferred direction of the first relief

profile (R) in the first surface portion and the grating vector or the preferred direction of the

second relief profile (R) in the second surface portion are directed substantially parallel (col. 3,

line 59 – col. 4, line 17).

As per claim 8:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

5. Furthermore, Staub et al. wherein the diffraction structure the grating vector or the preferred

direction of the relief profile (R) is substantially parallel to a gradient plane which is determined

by the gradient of the superimposition function (M) and a surface normal which is perpendicular

to the surface of the layer composite (col. 3, lines 33-58).

As per claim 9:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

5. Furthermore, Staub et al. teach wherein shaped in a first surface portion is the first diffraction

structure which is formed as the sum of the relief profile (R) and the superimposition function

(M) and wherein shaped in a second surface portion is the second diffraction structure which is

formed as the difference (R-M) of the same relief profile (R) and the same superimposition

function (M) (col. 7, line 56 - col. 8, line 14).

As per claim 10:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

5. Furthermore, Staub et al. teach wherein in the diffraction structure the grating vector or the

preferred direction of the relief profile (R) is substantially perpendicular to a gradient plane

which is determined by the gradient of the superimposition function (M) and a surface normal

which is perpendicular to the surface of the layer composite (col. 3, lines 33-58).

As per claim 12:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

5.  Furthermore, Staub et al. teach wherein in the first surface portion the first diffraction

structure is formed from the sum of the relief profile (R) and the superimposition function (M)

and wherein in the second surface portion the second diffraction structure is formed from the

first diffraction structure (S), the second diffraction structure being the first diffraction structure

which is mirrored at the plane of the surface pattern (col. 5, lines 7-20 and col. 6, lines 15-47).

As per claim 13:

      Staub et al. and Antes et al. substantially teach the security element as set forth in claim

5.  Furthermore, Staub et al. teach wherein the diffraction structure formed as the sum of the

superimposition function (M) and the relief profile (R) is shaped in at least one surface portion,

wherein the spatial frequency of the relief profile (R) is less than 2400 lines/mm and the

superimposition function (M) has a local inclination (.gamma.) measured in the diffraction plane

of the relief profile (R) (col. 6, lines 8-14), wherein the surface portion adjoins a background

field of the security feature, wherein the background field parallel to the cover layer has the

central surface with the local inclination .gamma.=0.degree. into which a sinusoidal diffraction

grating with a second spatial frequency and with a grating vector oriented in parallel in the

diffraction plane of the relief profile (R) is shaped (col. 5, lines 41-67), wherein the second

spatial frequency is so selected that upon perpendicular illumination with white light in one

viewing direction at a predetermined positive viewing angle the surface portion and the

background field do not differ with respect to of the color of the diffracted light (col. 6, lines 48-

65) and wherein that after a 180.degree. rotation of the layer composite about the surface normal

at the negative viewing angle the surface portion and the background field differ with respect to the color of the diffracted light (col. 6, lines 15-48).

As per claim 14:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 1. Furthermore, Staub et al. teach wherein the relief profile (R) is an isotropic matt structure (col. 3, lines 25-35).

As per claim 15:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 14. Furthermore, Staub et al. teach wherein the superimposition function (M) describes a relief image (col. 3, lines 33-40).

As per claim 16:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 14. Furthermore, Staub et al. teach wherein the superimposition function (M) describes a portion of a sphere (col. 6, lines 44-65).

As per claim 17:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 1. Furthermore, Antes et al. teach wherein the diffraction structure is restricted to a structure height of less than 40 .mu.m and the superimposition function (M) is restricted to a variation value (H) of less than 30 .mu.m (col. 4, lines 54-57), wherein the value of the superimposition function (M), which is used in the diffraction structure is equal to $\{(M)+C(x; y)\}$ modulo variation value $(H)-C(x; y)$, wherein the function $C(x; y)$ is restricted in amount to half the structure height (col. 4, line 57 – col. 5, line 2 and col. 6, lines 7-59).

As per claim 18:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 1. Furthermore, Staub et al. teach wherein surface elements having optically effective structures are parts of the surface pattern and at least one of the structure elements adjoins the security feature (col. 2, lines 20-52).

As per claim 19:

Staub et al. and Antes et al. substantially teach the security element as set forth in claim 1. Furthermore, Staub et al. teach wherein arranged on at least one of the surface portions is at least one identification mark with an optically effective structure differing from the diffraction structure (col. 2, lines 20-25) and, wherein that identification mark which can be used as a reference for orientation of the layer composite comprises an optically effective structure comprising at least one of a diffractive relief structure, a light-scattering relief structure and a mirror surface (col. 2, lines 25-52).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadia Khoshnoodi whose telephone number is (571) 272-3825. The examiner can normally be reached on M-F: 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emmanuel Moise can be reached on (571) 272-3865. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


                                                        /Nadia  Khoshnoodi/
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